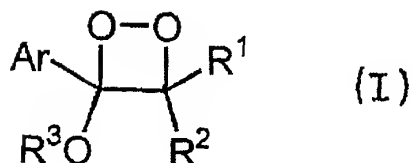
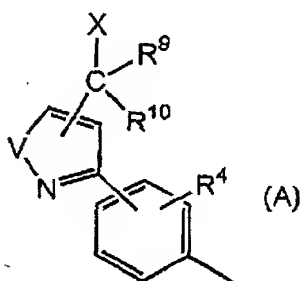


WHAT IS CLAIMED IS:

1. A 1,2-dioxetane derivative of the formula (I):

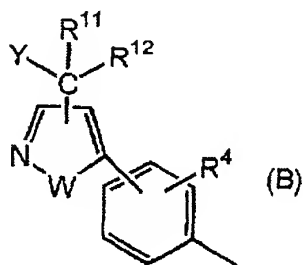


- wherein each of  $R^1$  and  $R^2$  which are independent of each other, is a hydrogen atom, an alkyl group or an aryl group, or  $R^1$  and  $R^2$  may together form a cyclic or polycyclic organic ring group spiro-bonded to the dioxetane ring,  $R^3$  is an alkyl group or an aryl group, or  $R^3$  and  $R^1$  or  $R^2$  may together form a condensed ring containing the dioxetane ring and a hetero atom, and Ar is a group of the formula (A):



- wherein  $R^4$  is a hydroxyl group, an alkoxy group, an aralkyloxy group, a group of  $-\text{OSi}(R^5R^6R^7)$  (wherein each of  $R^5$ ,  $R^6$  and  $R^7$  which are independent of one another, is an alkyl group or an aryl group), a phosphate group or a group of  $-\text{S}(\text{C}=\text{O})R^8$  (wherein  $R^8$  is an alkyl group or an aryl group), each of  $R^9$  and  $R^{10}$  which are independent of

each other, is a hydrogen atom, an alkyl group, an aryl group or a halogen atom, X is a halogen atom, and V is an oxygen atom or a sulfur atom, or a group of the formula (B):

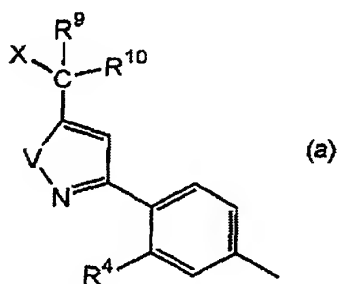


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wherein  $R^4$  is the same as  $R^4$  in the above formula (A), each of  $R^{11}$  and  $R^{12}$  which are independent of each other, is a hydrogen atom, an alkyl group, an aryl group or a halogen atom, Y is a halogen atom, and W is an oxygen atom or a sulfur atom.

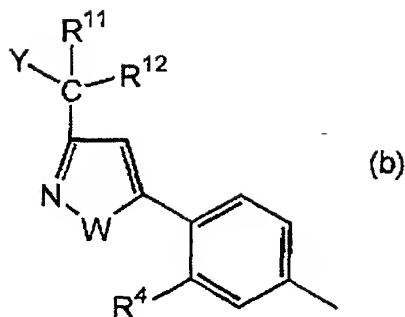
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2. The 1,2-dioxetane derivative according to Claim 1, wherein Ar is a group of the formula (a):



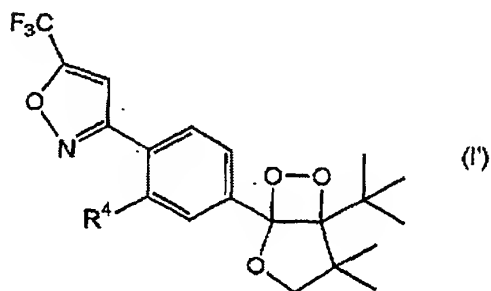
wherein  $R^4$ ,  $R^9$ ,  $R^{10}$ , X and V are the same as  $R^4$ ,  $R^9$ ,  $R^{10}$ , X and V in the above formula (A), or a group of the formula (b):

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wherein  $R^4$ ,  $R^{11}$ ,  $R^{12}$ , Y and W are the same as  $R^4$ ,  $R^{11}$ ,  $R^{12}$ , Y and W in the above formula (B).

3. The 1,2-dioxetane derivative according to Claim 1,
- 5 wherein  $R^3$  and  $R^1$  or  $R^2$  together form a condensed ring of a dioxetane ring and a furan ring, and  $R^2$  or  $R^1$  which does not form the condensed ring, is a  $C_{3-4}$  alkyl group.
4. The 1,2-dioxetane derivative according to Claim 1, which is represented by the formula (I'):



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- wherein  $R^4$  is the same as  $R^4$  in the above formula (A).
5. A chemiluminescent reagent which contains the 1,2-dioxetane derivative as defined in Claim 1.
6. A luminescence method which comprises decomposing
- 15 the 1,2-dioxetane derivative as defined in Claim 1 to

have chemiluminescence generated.

7. The method according to Claim 6, wherein the chemiluminescence is generated in the absence of any other enhancer.

5 8. A measuring method which comprises measuring a substance to be detected, in a test sample, by means of the luminescence method as defined in Claim 6.

9. A luminescence method which comprises letting a compound having a 1,2-dioxetane structure emit light in a  
10 protic solvent in the absence of any other enhancer.

10. The method according to Claim 9, wherein the luminous quantum yield is at least 1%.

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